EPA's SUMMARY OF COMMENTS AND RESPONSES
ON
CALLEGUAS CREEK CHLORIDE TMDL AND SUPPORTING TECHNICAL ANALYSIS

Prepared by USEPA, Region 9, Water Division (WTR-2), San Francisco,
March 22, 2002

<u>COMMENTORS:</u>

EPA received the following comment letters:

1. Camarillo Sanitary District

2. Calleguas Municipal Water District (CMWD)

3. Somach, Simmons & Dunn representing "the Agencies" - Cities of Simi Valley and Thousand Oaks, the Camarillo Sanitary District, the Ventura County Water Works District No. 1 and the Camrosa Water District

4. The Agencies" - Cities of Simi Valley and Thousand Oaks, the Camarillo Sanitary District, the Ventura County Water Works District No. 1 and the Camrosa Water District Comments on TMDL Staff Report & Technical Support Document

5. The Agencies" - Cities of Simi Valley and Thousand Oaks, the Camarillo Sanitary District, the Ventura County Water Works District No. 1 and the Camrosa Water District Comments on Water Quality Objectives Basin Amendment Document

6. Carollo Engineers, Integral Consultants, Whaley & Steiberg, and James R. Brownell, Comments on the TMDL Staff Report & Technical Support Document

7. Carollo Engineers, Integral Consultants, Whaley & Steiberg, and James R. Brownell, Comments on the Water Quality Objectives Basin Amendment Document

8. Los Angeles County Sanitation Districts (LACSD)

INTRODUCTION

This document summarizes the comments that were submitted, identifies the commentor or commentors (at the beginning of the comment) and responds to the comments. They are divided into three sections: legal compliance, general comments and detailed technical comments. Any change that is made to the TMDL, in response to the comments is indicated in the response. If no change is noted in the response, then no change was deemed to be needed in the TMDL.

Because EPA and the Regional Board jointly public noticed the Calleguas Creek TMDL for chloride, several of the commentors addressed their comments to both EPA and the Regional Board. This EPA responsiveness summary deals solely with comments relevant to EPA's establishment of the EPA Calleguas Creek TMDL. Comments which pertain solely to the State of California's proposed TMDL adoption action and not to EPA's TMDL (e.g., comments regarding the State's compliance with CEQA and implementation related details) are not discussed in this responsiveness summary. Similarly, comments regarding the State's proposed action to revise the reach definitions and water quality objectives for Calleguas Creek are not discussed in this responsiveness summary. Comments regarding these proposed State actions are being addressed separately by the Regional Board. As discussed in the TMDL, however, EPA's TMDL is based on the technical analysis of the Regional Board, and EPA has relied in large part on input from Regional Board staff in responding to comments regarding the technical aspects of the TMDL.

REFERENCES

1. U.S. Environmental Protection Agency Region 9 (USEPA Region 9 2002a). Total Maximum Daily Load for Chloride for Calleguas Creek. March 22, 2002.

2. U.S. EPA and California Regional Water Quality Control Board, Los Angeles Region (U.S. EPA Region 9/Los Angeles Regional Board 2002a). Technical Support Document (TSD) for the Total Maximum Daily Load for Chloride for Calleguas Creek. March 22, 2002.

3. California Regional Water Quality Control Board. Los Angeles Region. (2001a). Draft Staff Report on Chloride Total Maximum Daily Load for the Calleguas Creek Watershed and Tributaries. December 12, 2001.

4. California Regional Water Quality Control Board. Los Angeles Region. (2001b). Proposed Basin Plan Amendment to Revise the Reach Definitions and the Chloride Water Quality Objectives for the Calleguas Creek Watershed. Appendix C - Calleguas Municipal Water District, Survey of Crops Grown in Conejo Creek Tributaries and Calleguas Creek

5. Bachman, Steven, 1999. Los Posas Basin Groundwater Elevations and Water Quality.

Thousand Oaks, CA: Calleguas Municipal Water District and United Water Conservation District.

6. Zone Mutual Water District, 22 January, 1997, personal communication, Ann Grether DeMartini to Donald R. Kendall of Calleguas Municipal Water District.

COMMENTS AND RESPONSES ON
CALLEGUAS CREEK CHLORIDE TMDL, AND SUPPORTING TECHNICAL ANALYSIS

Part 1. LEGAL COMPLIANCE

I. Clean Water Act

I.A. **CMWD**:The proposed TMDL is inconsistent with the Clean Water Act because it is based in part on proposed water quality objectives rather than currently applicable objectives.

Response: On reconsideration and in light of various comments, EPA has changed the TMDL so that the final TMDL is calculated to meet the existing permanent standard of 150 mg/L.

I.B. **CMWD:** The proposed TMDL is inconsistent with the Clean Water Act because it does not result in achievement of water quality standards in all locations within the watershed.

Response: This TMDL is calculated to meet the applicable water quality standard at the watershed level where the designated beneficial use for AGR exists. In determining whether the standard of 150 mg/L is being met, the TMDL provides for specific monitoring points in locations where the agricultural and/or groundwater beneficial uses on which the objective is based are in existence. These specific monitoring points are the following: (1) USGS gauge Arroyo Simi in Reach 7; (2) Outflow from Reach 7 into Reach 6; (3) USGS gauge Conejo Creek upstream of Highway 101(Reach 9); (4) outflow from Reach 9A into Reach 9B where diversion occurs; (5) Conejo Creek & Calleguas confluence; and (6) USGS gauge Calleguas Creek main stem at Potrero Road (Reach 3) (also known as the Camarillo Hospital gauging station). Three of these five monitoring points are existing USGS stations where there are available daily flow measurements since 1968. The other three monitoring points were selected because of their locations at the confluence of several tributaries and where the diversion will occur. In Regional Board and EPA's opinion, these selected monitoring points are best representative of the water quality measurement for the entire Calleguas Creek, and they adequately capture the major sources and designated beneficial uses of the reaches in the watershed. In addition, because there has been historical data collected at these stations for many years, they should continue to serve as monitoring points in order to better monitor the effectiveness of the TMDL implementation in the future.

EPA notes that the draft TSD indicated that the proposed WQO of 110 mg/L would not be achieved at some of these monitoring points. However, in light of various comments, (1) EPA and the Regional Board have changed the TMDL so that the final TMDL is calculated to meet the existing permanent standard of 150 mg/L; (2) EPA and the Regional Board have revised flow volumes and concentrations in the assumptions for the linkage model used for this TMDL. Therefore, the calculations in the draft TSD are no longer valid and have been revised accordingly for the EPA TMDL. The modeling based on the re-calculation suggests that the chloride concentration at the first monitoring point (Reach 7

Arroyo Simi-USGS gauge) may slightly exceed the 150 mg/L. standard during the drought/post-drought condition (expected concentration of 154 mg/L). We note that this monitoring point is not in an area designated for AGR use, and that in the area downstream where AGR is in fact designated as a potential use, the modeled results indicate that concentrations will be well below the 150 mg/L standard, as evidenced by the results for the second monitoring point (Arroyo Simi below Moorpark, at the outflow between Reaches 7 and 6). Given the closeness of the modeled number to the water quality objective, the clear results indicating that the objective will be met at all the other monitoring points (and at all six points under the routine critical condition), and the absence of the AGR use in Reach 7, we would conclude that, in our best professional judgment, it is reasonable to assume that implementation of this TMDL should result in meeting the water quality objective at the watershed level and that, at this time, it is not necessary to recalculate the allocations at lower levels.

I.C. **Somach, Simmons & Dunn**: The proposed TMDL exceeds Clean Water Act authority. It is not reasonable to premise the TMDL on use of surface water for agriculture, since there is only minimal use of surface water for agriculture in the area. It is inappropriate to base a TMDL on water quality criteria related to groundwater, since the CWA does not regulate groundwater. The commentor cites case law that the CWA is designed to regulate discharge of pollutants to surface waters, not groundwater.

Response: This TMDL is being established to implement the numeric water quality objective for surface water of 150 mg/L. The cases cited by the commentor deal with NPDES permits and are not relevant to establishment of TMDLs.

The commentor appears to be arguing that the water quality standard on which this TMDL is based is invalid because one of the beneficial uses the objective is designed to protect is groundwater recharge. The water quality objective was adopted several years ago, and any comments regarding the objective, or challenges to that objective, should have been made at that time. EPA notes, nevertheless, that the beneficial use of groundwater recharge is in no way inconsistent with the Clean Water Act. CWA Sec. 303(c)(2)(A) provides that State water quality standards "shall be established taking into consideration [the use of the waters] for public water supplies, propagation of fish and wildlife, recreational purposes, and agricultural, industrial, <u>and other purposes</u>...." (emphasis added). EPA's 1994 Water Quality Standards Handbook (p. 2-4) specifically includes groundwater recharge as a use a State may adopt.

I.D. **Somach, Simmons & Dunn:** The CWA does not require states to develop water quality criteria for agricultural use, which is not an instream use, citing CWA 303(c)(2)(A).

Response: CWA 303(c)(2)(A) does include agricultural uses, as indicated in the response to comment I.C.

I.E. **LACSD:** The uses ostensibly protected by the TMDL are not Clean Water Act uses. The Clean Water Act protects "fishable/swimmable" uses. Groundwater is exempt from CWA regulations; therefore, any uses related to groundwater are beyond the reach of the CWA. Standards more stringent than the "fishable/swimmable" requirement are not required by the CWA. Thus, they are not subject to EPA approval under CWA 303(c)(3), and they do not become "applicable water quality standards" for federal CWA purposes, including for 303(d) listing decisions. Neither AGR nor GWR is a fishable/swimmable use. Additionally, neither is an "existing use" because it is not attained in the water body, citing 40 C.F.R. 131.3(e). Therefore, a TMDL to protect those uses is inappropriate.

Response: The uses being protected by this TMDL are Clean Water Act uses. The commentor's analysis is incorrect in several respects. While fishable, swimmable waters are indeed a goal of the Clean Water Act, the Act at Sec. 303(c) lists other uses, specifically including agricultural, which a State must consider in establishing water quality standards. All water quality standards which a State establishes (including numeric and narrative standards, designated uses, and an antidegredation policy) are subject to EPA approval. Finally, the definition of "existing uses" in 40 C.F.R. 131.3(e) turns on whether the uses were actually attained on or after November 28, 1975, not whether the water was used "in" the waterbody or "outside" the waterbody. Whether a use is "existing" in no way depends on whether the water is removed from the waterbody, as it is for numerous uses, such as municipal water supply, as well as agricultural use or groundwater recharge. Moreover, the determination of whether a use is "existing" goes to whether the use can be removed, not to whether a water quality objective based on that use is a suitable basis for a TMDL. See also response to comment I.C.

II. OMB Directives

II.A. **CMWD**:Adoption of the proposed TMDL would be inconsistent with recent OMB directives that TMDLs be based on the best available data.

Response: EPA is unaware of such OMB directives and the commentor did not provide any further reference to the directives. EPA and the Regional Board staff have used the best available information to develop this TMDL, and have carefully reviewed all the comments and information submitted during the comment period.

The information considered in development of the TMDL includes the following: (a) for the Surface Water Conditions, (1) historical data: the Regional Board examined its database which includes chloride measurements for various locations in the waterbody, including 107 samples that form a time-series record within three general portions of the waterbody between 1954-1999 (results are presented in the TSD); (2) current data: Regional Board analyzed more recent data (2000) from the USGS gauge stations in the Calleguas Creek in order to characterize the seasonality of the impairment accurately. Regional Board also examined the WDRs from the five POTWs in the watershed, stormwater urban runoff data from the Los Angeles County Stormwater monitoring reports; and the information in the Calleguas Creek Characterization Study by the Larry Walker Associates 2000. (b) for the Groundwater Conditions, the Regional Board staff considered the following information in its analysis: (1) Evaluation of Surface-water/Ground-water Interactions in the Santa Clara River Valley, Ventura County, California by USGS, 1999; (2) Las Posas Basin Groundwater Elevations and Water Quality by Bachman for the Calleguas Municipal Water District and United Water Conservation District, 1999. (3) Annual Groundwater Monitoring Report by Camrosa Water District, 1998. (4) Report on Arroyo Simi Characterization by Montgomery-Watson for the Simi Valley County Sanitation District, 1995. (5) North Las Posas Basin Hydrogeologic Investigation by the Calleguas Municipal Water District and Metropolitan Water District of Southern California, 1989. (6) Report on Santa Rosa Groundwater Basin Management Plan. Thousand Oaks, California by Boyle Engineering Corp. for the City of Thousand Oaks and Camrosa County Water District, 1987. (7) Groundwater in the Thousand Oaks Area, Ventura County, California by USGS, 1980. (8) Calleguas Creek Characterization Study (Larry Walker Associates 2000)

III. Water Quality Standards

III.A. **Somach, Simmons & Dunn**: The proposed TMDL would establish a TMDL for standards which do not exist... There is no authority to establish a TMDL for a water quality standard which has not completed the approval process by the State and EPA.

LACSD: The TMDL should not be based on proposed water quality objectives rather than the current objectives.

Response: On reconsideration and in light of various comments, EPA has changed the TMDL so that the final TMDL is calculated to meet the existing permanent standard of 150 mg/L.

III.B. **The Agencies:** The TMDL should not be based on a water quality objective that has not been adopted. The TMDL is inappropriate because no linkage has been shown between regulation of the surface water and a resulting improvement in groundwater used for agriculture, and the Clean Water Act does not regulate groundwater. The listing of Calleguas Creek as impaired for chlorides is questionable because of the absence of a connection between surface water and groundwater.

Response: On reconsideration and in light of various comments, EPA has changed the TMDL so that the final TMDL is calculated to meet the existing permanent standard of 150 mg/L. Calleguas Creek was properly included in the State's 303(d) list because the 150 mg/L standard was being exceeded. The commentor appears to be questioning the validity of the standard itself. That standard was adopted many years ago, and any challenges or comments regarding that standard should have been made at that time. Nevertheless, we note that water quality standards designed to protect agricultural and groundwater recharge beneficial uses are proper and within the scope of the Clean Water Act. See response to comment I.C. While the Clean Water Act does not generally "regulate" groundwater by requiring NPDES permits for discharges to groundwater (which some exceptions), the Act itself contains many references to groundwater and programs designed to protect groundwater as well as surface water. See, e.g. CWA Sec. 102 ("comprehensive programs for preventing, reducing, or eliminating the pollution of the navigable waters and ground waters..."), Sec. 208(b)(2)(K) (waste treatment management plans shall include a "process to control the disposal of pollutants...to protect ground and surface water quality"), Sec. 319(b)(2) (nonpoint source control plans to identify best management practices "taking into account the impact of the practice on ground water quality").

III.C. **LACSD:** The TMDL is based on improper water quality objectives. The current objective of 150 mg/L was designed to protect agriculture; however, the Clean Water Act does not require protection of agricultural crops, and particularly not the most sensitive agricultural crop. Federal law requires that criteria support a water's most sensitive use, not the most sensitive sub-category within a particular use.

Response: See response to comment I.C. EPA's regulations at 40 C.F.R. 131.11(a) do require that for waters with multiple use designations, the criteria shall support the most sensitive use. This regulation in no way prohibits the State from developing a criterion to protect the most sensitive sub-category of the use.

IV. Current Water Quality Objectives

IV.A. **LACSD:** The only objectives in the Basin Plan are the current objectives of 150 mg/L for the reaches in question. The commentor notes that EPA's recommended numeric goal for chloride for drinking water is 250 mg/L, and the goal for protecting aquatic life is a chronic value of 230 mg/L and an acute value of 860 mg/L. Because there is no aquatic life criterion for chloride in the reaches in question, there is no "applicable water quality standard" for chloride upon which a TMDL could properly be performed.

Response: The point of this comment is not clear. As noted in response to several other comments, the final TMDL is based on the existing permanent objective of 150 mg/L. Any less stringent recommended numeric goals for drinking water or aquatic life are not relevant to this TMDL. The lack of an aquatic life criterion does not negate the water quality standard which this TMDL is designed to achieve.

IV.B. **LACSD:** The current chloride objective of 150 mg/L was not adopted in conformance with federal law because it lacks the requisite sound scientific rationale or appropriate technical basis.

Response: The commentor has not provided any specific reasons to support the allegation that the 150 mg/L standard is based on an inadequate scientific foundation. Moreover, the water quality standard was adopted several years ago and could have been challenged at that time. Section 303(c)(1) of the Clean Water Act requires that a State shall, from time to time, but at least once every 3 years, hold public hearings to review applicable water quality standards, and, as appropriate, to modify and adopt standards. The commentor may wish to bring its concerns to the State's attention during its next review of standards.

V. 303(d) Listing

V.A. **Somach, Simmons & Dunn**:Calleguas Creek was improperly listed under Clean Water Act 303(d) because the 150 mg/L standard was improperly treated as an instantaneous maximum rather than a weighted annual average.

Response: Both now and when the 1998 listing decision was made, the chloride objective in the Basin Plan was based on a "not to exceed" analysis; therefore, listing decisions based on that analysis are appropriate. It is consistent with the Regional Board's long standing practice of applying water quality objectives as instantaneous maximum.

V.B. **Somach, Simmons & Dunn**: Calleguas Creek was improperly listed because a water quality objective based on agricultural use is improper.

Carollo Engineers Comment: The 303(d) list did not specifically identify groundwater recharge (GWR) as a beneficial use impaired by chloride. We believe that the evidence does not support the linkage of increasing groundwater chloride concentrations to groundwater recharge.

Response: See response to Comment I.C. Agricultural uses are specifically included in CWA 303(c).

VI.Administrative Procedure Act

VI.A. **Somach, Simmons & Dunn**: EPA's TMDL is improper because there has been no notice of rulemaking under the Administrative Procedure Act.

Response: TMDLs are not rules. EPA and the State jointly public noticed the draft chloride TMDL and solicited public comment by a notice in the Ventura County Star on December 19, 2001. See also response to comment VI.B.

VI.B. **LACSD:** EPA's publication in the Los Angeles Times of the proposed TMDL was insufficient under the Administrative Procedures Act. The APA generally requires federal agencies to provide "general notice of a proposed rulemaking" in the Federal Register. 5 U.S.C. 553(b). Adoption of new TMDLs by the EPA is clearly a rulemaking. *See Sierra Club v. Environmental Protection Agency*, 162 F. Supp. 2d 406, 419-20 (D.Md. 2001)(finding that development of a list or load under the CWA constitutes a rulemaking for which notice must be provided); *see accord Asarco Inc. v. State of Idaho*, Order on Summary Judgment, Case No. CV-00-05760 (D.Id. 2001) (the establishment of the

> TMDL involved "rulemaking.") Thus, under the APA, any proposed TMDLs must be properly published in the Federal Register to provide adequate public notice and opportunity for comment.

Response: The Clean Water Act does not require publication in the Federal Register for TMDLs; indeed, the Act does not require any type of public notice prior to establishment of TMDLs by either EPA or a State. EPA regulations do require some public review when TMDLs are established under certain circumstances; for example, 40 C.F.R. 130.7 provides that when EPA establishes a TMDL after disapproving a State TMDL, EPA must "issue a public notice seeking comment" and consider the public comments received. Again, however, there is no requirement for publication in the Federal Register.

For the Calleguas Creek TMDL, EPA determined that the most effective way of providing notice and soliciting public comment was through the local newspaper of general circulation. Thus, EPA and the State jointly public noticed the draft chloride TMDL for Calleguas Creek in the Ventura County Star**.** Copies of the draft TMDL and the TSD were available for public review on the EPA Region 9 and Regional Board's website. The draft TMDL was mailed to all parties on the Regional Board mailing list. The public had 45 days in which to submit comments. EPA has considered all the comments received, and is responding to them in this Responsiveness Summary. We note that this means of involving the public proved to be quite effective, in that not only this commentor, but several others, provided detailed comments on the draft TMDL.

EPA disagrees with the commentor's assertion that establishment of TMDLs constitutes "rulemaking" under APA 553. This TMDL is a specific factual determination -- a calculation of the chloride loads this particular waterbody can receive and still achieve the water quality standards applicable to the waterbody. It has no applicability nationwide, nor even statewide. Furthermore, we submit that if Congress had intended to require EPA to use rulemaking procedures, it would have given EPA more than the 30 days in which EPA is expected to establish TMDLs under CWA 303(d)(2).

EPA notes that the *Asarco* case cited by the commentor has no applicability to this TMDL, as it was a state court decision, based on state law, applicable only in the state of Idaho. Moreover, EPA respectfully disagrees with the dicta in the *Sierra Club* case cited by the commentor, which suggests that establishment of a TMDL by EPA should be considered a rulemaking. That dicta relies on language in CWA <u>303(c)</u> regarding establishment by EPA of State water quality standards. EPA submits that the language in CWA 303(c) does <u>not</u> suggest that EPA action under a separate provision, <u>303(d)</u>, should be considered rulemaking; to the contrary, the fact that Congress explicitly established a rule-making procedure for water quality standards indicates that such a procedure is <u>not</u> required for other actions, such as TMDL establishment, where the statute does not specify any type of public participation at all, much less rulemaking procedures.

VII. Implementation

VII.A. **Somach, Simmons & Dunn**: The proposed TMDL contains elements that are plainly outside EPA's authority, such as implementation measures flowing from State law authorities.

Response: The main responsibility for implementing and monitoring resides with the State. Therefore, EPA's TMDL does not contain an implementation plan. Rather, there is a brief discussion of general recommendations to the State.

VIII. EPA's Action

VIII.A. **Somach, Simmons & Dunn**: Because of technical deficiencies in the draft TMDL, the Regional Board will have to prepare the functional equivalent of an EIR prior to incorporating the TMDL into the Basin Plan; thus, for EPA to proceed is illogical.

Response: EPA is required to establish this TMDL by March 22, 2002, under the Consent Decree in *Heal the Bay, Inc. et al. V. Browner*. EPA disagrees that there are technical deficiencies and considers the record adequate to support establishment of a TMDL at this time.

IX. Seasonal Variations

IX.A. **LACSD:** The TMDL does not meet federal requirements because it does not include seasonal variations. Despite the fact that the draft TMDL states that it is not expected that conditions are impaired during storm flow, the draft TMDL fails to exclude these non-impaired conditions.

Response: EPA agrees that the draft TMDL was unclear. The final TMDL makes clear that the TMDL applies only to non-storm conditions.

X. Water Quality Objectives/Margin of Safety

X.A. **LACSD:** The proposed objectives change to 100 mg/L and numeric targets of 100 mg/L are an unreasonably large margin of safety.

Response: As noted in other responses, the final TMDL is based on the existing standard of 150 mg/L. EPA disagrees that the margin of safety used in calculation of the TMDL is unreasonable. We note that the State's peer review of the draft TMDL specifically included analysis of the margin of safety, and the peer review concluded that the methodology used to determine the margin of safety was acceptable and appropriate.

XI. Suitability for TMDL Calculation

XI.A. **LACSD:** Chloride appears to be a pollutant where the concentration is the relevant indicator. The TMDL fails to establish a need for regulation of chloride based on mass. This indicates that chloride is not a pollutant suitable for TMDL calculation.

Response: Chloride is a pollutant suitable for TMDL calculation. EPA determined in 1978 that all pollutants were suitable for TMDL calculation, under proper technical conditions. The calculations and modeling performed by the Regional Board indicate that this pollutant is suitable for TMDL calculation. EPA and the Regional Board agree that concentration is important, and thus the mass loadings are derived from the appropriate concentrations. However, TMDLs are normally expressed as mass loads, and we consider that to be appropriate for this TMDL. See also response to General Comments II.M regarding mass loads.

XII. Future Growth

XII.A. **Camarillo Sanitary District:** The proposed loadings make no provision for growth. Urban dischargers will be required to comply with both chloride concentration requirements and mass loadings. As flows increase in the future due to ordinary population growth, it will be necessary to discharge at even lower concentrations.

Response: The Clean Water Act does not require TMDLs to include explicit provision for growth, although in general EPA supports providing allocations for future loading sources where feasible. Regional Board staff did consider future growth in preparing the TSD for the Calleguas Creek chloride TMDL. The TSD discusses the possibility that the population in the Calleguas Creek watershed could increase by 20% in the next ten years, and that the chloride load, along with the general amount of wastewater discharge, could be expected to increase correspondingly. The TSD suggests that in the future, an increase in the chloride loading capacity may be possible, so long as it is contained in discharges with sufficient dilution. If that occurs, the Regional Board may wish to calculate a new TMDL to account for the changes.

XIII. CALFED Program Objective

XIII.A. **CMWD:** Adoption of the TMDLs would be inconsistent with a primary objective in the CALFED program of increased water recycling.

Response: The TMDL is established at levels necessary to achieve water quality standards, as required by the Clean Water Act. The Regional Board has indicated that in developing its implementation measures, water recycling projects consistent with the TMDL's allocations will be encouraged and permitted.

PART 2. GENERAL COMMENTS

Concept of the TMDL

II.A. **The Agencies:** The Technical basis for staff's proposal is deficient. It is based on flawed concept that imposing strict limitations on POTWs' discharges will result in an improvement to groundwater relied upon by agriculture for irrigation of chloride sensitive crops.

Camarillo Sanitary District: The reports do not show that better in-stream water quality will result in improvement in groundwater quality.

Carollo Engineers : Reducing the levels of chloride in stream flow will not significantly reduce the levels of chloride in groundwater because stream flow recharge is not the primary source of increasing chloride concentrations in the groundwater. The chloride budget for the groundwater basins indicate that the predominant chloride load is from agricultural returns. This important chloride source has not been included in further analysis by the RWQCB.

The Agencies: There is no evidence to support the conclusion that increases in chlorides in shallow or perched groundwater are directly related to an increase in surface water chloride concentrations.

Response: Models and scientific analyses based on best available data and best current understanding of the watershed indicate that the allocations specified in the TMDL will achieve water quality improvement in surface water and associated (hydraulically contiguous) shallow groundwater used for irrigation**.** The goal of the TMDL is to meet water quality standards in surface water. Improvement to water quality in groundwater aquifers is not a goal of the TMDL.

We also wish to draw a distinction between the dispersed, discontinuous shallow unconfined groundwater aquifers (intersecting the surface in some locations, and extending to depths of about 30 feet) which are hydraulically contiguous to the surface water; and the deep groundwater basins of the watershed (overlain by impervious strata, and extending to depths of about 900 feet). The shallow groundwater in some locations is hydraulically contiguous with the surface water, and therefore shares the chemical characteristics of the surface water; in reaches where the surface water is impaired for chloride, and the shallow groundwater is used to supply the same beneficial uses, the shallow groundwater therefore is necessarily impaired also. There is ample evidence indicating the surface water's impact on the shallow or perched groundwater. For example, the Bachman study (1998) shows that the surface flow of the Arroyo Las Posas entirely disappears into underflow during much of the year and provides recharge to the shallow groundwater.

Alternatives

II.B **The Agencies:** Other more effective, practical and less costly alternatives exist.

Response: This TMDL is required to be established under the Clean Water Act because water quality standards are not being met. EPA's TMDL does not contain an implementation plan, so comments regarding the Regional Board's proposed implementation plan are being addressed by the Regional Board staff. Regional Board staff note that although the Regional Board's implementation plan presents advanced treatment technology and accompanying brine conveyance as one possible alternative, other alternative means consistent with State and Federal regulations are acceptable under the implementation plan.

Recycled Water Project

II.C. **CMWD:** Adoption of the proposed amendments would discourage development of recycled water projects.

LACSD: The draft TMDL sets up a water quality management system which will seriously impede, rather than encourage, future water reclamation projects. Parts of the Calleguas Creek watershed are entirely dependent on imported water, and during periods of drought can suffer shortages of water.

Response: This TMDL is required to be established under the Clean Water Act because water quality standards are not being met. EPA's TMDL does not contain an implementation plan, so comments regarding the Regional Board's proposed implementation plan are being addressed by the Regional Board staff. Regional Board staff note that under the Regional Board implementation plan**,** water recycling projects consistent with the proposed allocations will be encouraged and permitted. According to Regional Board staff**,** remedies other than the one evaluated in the proposed TMDL implementation plan, including those which enhance water recycling and reuses, are allowed with in the framework of the proposed TMDL implementation plan and will be permitted if they attain the applicable water quality standards and allocations.

Watershed Planning Process

II.D. **CMWD:** Regional Board should allow the Watershed Planning group to address chloride and other 303(d) listed constituents. Adoption of the proposed amendments would undermine the Calleguas Creek Watershed Planning Program, which would provide a greater protection for agricultural beneficial uses than the proposed amendments... Important policy issues should be considered before the Regional Board and USEPA adopt the proposed WQOs and TMDL. Some of these are better addressed by the Calleguas Creek Watershed Management Plan group. The ideas under development by that group cannot be implemented unless the Regional Board and USEPA delay action.

Camarillo Sanitary District: Early adoption of an individual chloride TMDL would be counter to the goals and intentions of the Calleguas Watershed management Plan, which seeks a holistic solution to water quality in the watershed

Response: The proposed TMDL does not preclude or inhibit other planning processes that would improve water quality. EPA encourages development of measures to address the chloride problem through a watershed planning process, and we expect that the Regional Board will take into consideration recommendations of the Watershed Planning Program in developing implementation measures for the TMDL. Because of consent decree deadlines, establishment of this TMDL cannot be delayed**.**

Agricultural Practices Assumption

II.E. **Camarillo Sanitary District:** The reports make simplifying assumptions based on false premises about agricultural practices. Staff technical support document assumes little or no irrigation water directly enters surface waters; on the contrary, runoff from agricultural fields may be widely observed, and may be expected to contain high concentrations of chloride and other salts.

The Agencies: The characterization of the Calleguas creek watershed is fatally flawed in that it fails to include irrigated agriculture as a major source of chloride loading.

Carollo Engineers: The stream flow chloride reported exceeds the wastewater chloride discharged to the streams. This cannot happen unless additional inflows occur and the chloride in those inflows exceed the wastewater chloride. The most likely explanation for the high stream flow chloride is the occurrence of agricultural returns. The irrigated acreage within the Calleguas Creek watershed has increased since the 1950s, and a corresponding increase in agricultural returns would be expected. The staff report does not attempt to identify the source of increased stream flow chloride. A rational remedy cannot be identified without identifying the source.

Carollo Engineers: Irrigation tailwaters and irrigation return contribute greater loads of chlorides to the groundwater basins (approximately 80% of the total load) and to the surface waters than POTW discharges.

Carollo Engineers : The shallowest zone of a water-table aquifer is the most impacted by irrigation returns. In addition, pumping from such a shallow well in close proximity to a stream is essentially equivalent to dewatering the stream. Pumping from a shallow well next to a stream may constitute an appropriation requiring a State Board permit.

Carollo Engineers While irrigation with groundwater creates an indirect chloride load to the groundwater system, irrigation with imported water creates a direct chloride load. This effect is not considered.

Carollo Engineers: The deep percolation of irrigation water leaches naturally occurring chloride in the unsaturated zone. The unsaturated zone is thick within much of the Calleguas Creek watershed. Irrigation water that percolates through the unsaturated zone incorporates the naturally occurring chloride in the soil. The chloride occurs naturally because the upper San Pedro formation was deposited on an ocean floor and the low permeability of the formation prevented the subsequent natural flushing of the original chloride. However, the introduction of an irrigation percolate transports the chloride to the active groundwater system. The resulting load represents a substantial part of the total load to the groundwater system, but this was not considered.

Response: We recognize that leaching and evapotranspiration cause concentration of chloride. EPA and Regional Board staffs' conclusion about chloride loads from agricultural practices is that the agriculture does not contribute chloride per se, but does serve to concentrate chloride applied to the field in irrigation water. The chloride in the irrigation water originates with external sources, including surface waters and shallow groundwater used to irrigate fields in some reaches. The origin of chloride in that surface water and shallow groundwater includes POTWs, non-storm discharges to storm drains, pumped groundwater discharges, and other activities identified in the TMDL.

In the models used in developing this TMDL, that concentration occurs in the root zone of agricultural fields. We recognize that chloride does enter the aquifers and , directly or indirectly , the surface waterbody after having been concentrated by agricultural practices. The models and analyses incorporate that chloride load in the form of rising groundwater or groundwater discharges via natural processes (i.e., other than pumped groundwater discharges), using best available information about concentration and volume per time of such discharges. To consider leaching as a separate load would be to double-count that chloride load.

Irrigation water that originates as deep groundwater or imported water purchased by agricultural users does contain chloride that does not originate with sources identified in the TMDL**.** We conclude those loads are incorporated indirectly in the model, in the forms of rising groundwater and a small number of agricultural return flows identified in the watershed by Regional Board staff observations. Those assigned loads are consistent with best available information about actual observed chloride concentrations in the waterbody. To the extent that those loads originate from outside the watershed, they do contribute to the chloride impairment. They are assigned LAs in the TMDL and form part of the mass balance model that predicts changes in chloride concentration when specified WLAs are attained.

We agree that tail water and other discharges may exist at some time in some parts of the watershed.

We do not agree that calculations of chloride loadings are erroneous. Transport of chloride from irrigation water into groundwater and then into surface water is included in the model in the form of spontaneous and pumped groundwater discharges into the waterbody.

To the extent that chloride from naturally occurring deposits enters the waterbody with discharging groundwater, that load is also incorporated into the model in the form of estimated chloride load from groundwater discharges. That load has the effect of reducing assimilative capacity available in the surface water to discharges from permitted sources, and therefore is considered when allocating loads among dischargers.

II.F. **The Agencies**: The TMDL does not take into account the salt tolerance of different rootstocks of avocados, nor did it consider various management practices that can be implemented to improve the crops' tolerance to chlorides. The proposal shifts the entire burden of protecting chloride sensitive crops to the POTWs without the farming community having to take any steps to better manage the chlorides**.**

Response: This TMDL is required because the water quality objective of 150 mg/L. is not being met. The Regional Board will consider this comment in its consideration of changes in the chloride WQO.

II.G. **The Agencies:** According to Ventura County records, Zone Mutual Water company has five wells that are between 785 feet and 885 feet deep used to provide water for irrigation purposes. This information contradicts the staff report that Zone Mutual pumps water from 30-foot wells adjacent to Calleguas Creek or that it serves as a primary source of irrigation water.

Response: Zone Mutual Water company owns deep wells as well as operate shallow wells near the Calleguas Creek. In its January 22, 1997 letter to Calleguas Municipal Water District, Zone Mutual provided data that demonstrates substantial increases in chloride concentration in its irrigation water. This significant increase has impacted the yield of sensitive crops. More recent data (96-99) also shows the increased trend of the chloride concentration in the shallow wells near the Calleguas Creek watershed (refer to Zone Mutual Water District (22 January , 1997) in the reference).

II.H. **Camarillo Sanitary District:** The reports make false assumptions regarding us**e** of imported water by agriculture.

The Agencies: Staff ignored ongoing purchases from municipal water utilities for agricultural purposes. In the past three years, a steady 14% of the City of Camarillo's water sales have been to agricultural growers for irrigation for crops, primarily strawberries. Agriculture accounts comprise some of the largest consumers of city water, which is a blend of approximately 2/3 imported and 1/3 pumped. All water supplies by the Cities of Thousand Oaks and Simi Valley, and the California-American Water Company, are imported from Northern California through the State Water Project. Camrosa Water District also delivers significant quantities of water for agricultural irrigation from predominantly imported source waters. Calleguas Municipal Water District maintains records that document the proportional share of imported water used for agricultural water use in the watershed.

Response: We recognize that the draft Technical Support Document fails to recognize the magnitude of water importation during non-drought periods. Changes have been made in the final TSD to reflect this emphasis. Reports by agricultural users document an increase in importation during periods of low rainfall in the watershed, and also document a decreased availability of local water supplies. Those reports also document an increase in chloride concentration in imported water during periods of statewide drought, which commonly coincide with periods of low rainfall in the watershed. Both conditions contribute to an increase in the load of chloride in imported water during periods of drought.

Application of TMDL

II.I **The Agencies:** No TMDL is proposed for Reaches 8 and 7. Consequently, these reaches will not have to comply with the proposed in-stream standard of 110 mg/L for chloride. As a result, the City of Simi Valley will be facing a much lower WLA (74 mg/L) than it would face if reaches 7 and 9 would be required to meet the standard. The TMDL process requires that all point sources and non-point sources be given a WLA or LA.

Response: This EPA TMDL is based on the permanent objective of 150 mg/L. The reductions specified for the Simi Valley POTW have been revised, and the target discharge concentration for Simi Valley POTW is estimated to be 134 mg/L during routine critical condition. The Regional Board's estimate shows the reduction required 19% is achievable. That WLA is calculated assuming that dischargers upstream of the Simi Valley POTW are subject to reduced loads: pumped groundwater in Reach 7 subject to WDR requirements are required to reduce chloride concentration during critical conditions. Calculations using the model specified WLAs are now based on discharges at numeric target for model calculations show that Reaches 7 and 8 will attain the WQO of 150 mg/L during nearly all conditions, excepting only the post-drought critical conditions for the upstream part of Reach 7, where the WQO is exceeded by 4 mg/L. That location is not part of the reach where the chloride-sensitive beneficial uses are present.

II.J. **Camarillo Sanitary District:** The TMDL should provide for a rolling average and instantaneous maximum in all reaches.

Response: The existing WQO in all reaches upstream of Potrero road is defined only in terms of and instantaneous maximum, so that is the appropriate measure for the TMDL.

Beneficial Use/Water Quality Objectives

II.K. **Camarillo Sanitary District:** On the basis of protection of agricultural beneficial use, a chloride TMDL for the lower reaches of the Conejo and Calleguas Creeks is unwarranted and unjustified.

Response: Certain reaches are not included in this TMDL; those are indicated with asterisks in Table 1 of the final TMDL. Other reaches must be included because the 1998 Clean Water Act 303(d) list indicates that they are not meeting the water quality objective for chloride.

II.L. **LACSD:** Staff Report on the proposed chloride WQO change and reach redefinition does not address the attainability of the proposed WQO in the northern reaches of the waterbody. EPA guidelines state a use attainability analysis (UAA) may be conducted if it is suspected that standards are not attainable due to natural biological limitations, physical limitations, chemical limitations, irreversible man-made factors, or economic reasons. Significant discharges in to the waterbody of groundwater with chloride in concentrations of 150 mg/L or greater produce a likelihood that these natural conditions will prevent attainment of the proposed WQO of 110 mg/L.

Response: While this comment primarily addresses the State's proposed WQO and reach definition changes, we note that EPA and Regional Board Staff do not agree that existing groundwater concentrations are natural biological, physical, or chemical limitations, based on known increases in chloride in present conditions compared to periods before intensive agricultural and urban land uses in the watershed. We do not agree that those anthropogenic causes for increased chloride concentration are irreversible. Regional Board Staff has elected not to conduct a UAA because analyses for the TMDL support a finding that the WQO can be attained. Regional Board staff indicate that a UAA could be considered if the TMDL fails to attain the water quality objectives.

II.M. **LACSD**: The Regional Board's proposal to include mass targets in addition to chloride targets for POTW WLAs does not make sense. Protection of the agricultural beneficial use in driven by concentration rather than mass, so that additional flow with concentration at the specified limit would improve water quality rather than contribute to impairment.

Response: TMDLs are usually calculated in mass loads, and EPA considers that to be appropriate for this TMDL. The chloride mass in surface water contributes to impairment of groundwater quality: even though higher concentration in the aquifer may be diluted in the short run by lower concentration surface water recharge, the mass of chloride added by surface water (and by irrigation making use of that surface water) in the long run adds to the mass of chloride that cycles between groundwater and irrigation (which concentrates chloride through the agricultural concentrating effect), so that chloride impairment of the aquifer increases in the long run.

II.N. **LACSD:** The current WQO is incorrectly interpreted as an instantaneous maximum of 150 mg/L. The Regional Board should not undertake a TMDL without understanding the underlying basis of the original objective. Many POTWs in the watershed discharge wastewater and/or discharge to groundwater with annual average chloride concentrations less than the current WQO, so therefore could not be part of the cause of impairment if the WQO is interpreted as an annual average.

Response: Chloride mass discharged by POTWs contributes to the mass of chlorides subject to the agricultural concentrating effect, which contributes to chloride concentration in groundwater discharges, and in that way contributed to impairment of surface waters. The current water quality objective is measured as an instantaneous maximum, so it is appropriate to calculate the TMDL in that way.

II.O. **LACSD:** The TMDL is designed to attain a potential beneficial use in Reaches 6, 7, and 8 that may not be attainable, if it requires a WQO of 110 mg/L. The Regional Board should conduct a UAA, and in the interim should adopt a variance to allow temporary reprieve from meeting current standards.

Response: On reconsideration and in light of various comments, EPA has changed the TMDL so that the final TMDL is calculated to meet the existing permanent standard of 150 mg/L (details are provided in TMDL and TSD).

II.P. **LACSD:** The draft TMDL proposes WLAs for POTWs at Simi Valley and Moorpark that would attain the proposed new WQO of 110 mg/L in their receiving reaches, but those reaches receive significant discharges from an underlying groundwater basin that has chloride objective of 150 mg/L. The Regional Board is requiring desalinization treatment at these two facilities in order to dilute what appears to be natural conditions in the waterbody.

Response: On reconsideration and in light of various comments, EPA has changed the TMDL so that the final TMDL is calculated to meet the existing permanent standard of 150 mg/L in all the reaches included in the TMDL. We note, however, that EPA and Regional Board Staff do not agree that discharges of groundwater are due to natural conditions or to irreversible anthropogenic factors. Additionally, Regional Board staff have indicated that they encourage measures to reduce chloride concentration in influent water for industrial uses and for potable water and that such measures may form part of a pollution prevention approach to achieving the specified WLAs under the Regional Board's implementation plan for the TMDL.

II.Q. **Carollo Engineers:** We do not agree that the beneficial use of groundwater recharge is necessarily impaired and no substantial basis for this conclusion is stated… The groundwater recharge beneficial use of surface streams is not achieved due to the pumping, and impacts of agricultural irrigation practices.

The Agencies: The perched aquifers near the Camrosa Water District water storage ponds do not provide recharge to the lower aquifer system of the Pleasant Valley

Groundwater Basin. The assumption made by staff that groundwater recharge beneficial use for in-stream surface water is impaired is not substantiated by the chloride concentrations found in wells.

The Agencies: The Basin Plan identifies confined and unconfined/perched aquifers. The confined aquifers have a Basin Plan objective of 150 mg/L chloride. The confined aquifers are not susceptible to groundwater recharge in this area. The unconfined/perched aquifers do not have a Basin Plan water quality objective. While the Basin Plan identifies an existing agricultural beneficial use for unconfined/perched groundwater, there is no documentation supporting impairment of this use.

Response: The unconfined/perched aquifers are included in this TMDL to the extent they are hydraulically contiguous to the surface water and are used for beneficial uses within particular reaches of the watershed. The designated surface water AGR use, as specified in the current Basin Plan, is designed to protect the quality of agricultural supply water, and the TMDL extends that protection to shallow groundwater that is considered part of the resource because it is hydraulically contiguous with surface water. If the surface water in a given reach is impaired for a designated beneficial use, then the hydraulically contiguous groundwater is also impaired because (by definition of contiguity) it has the same chemical characteristics as the surface water of the reach.

II.R. **The Agencies:** The agricultural designation in reaches 12 and 13 is incorrect. Agriculture is not an existing beneficial use of the surface waters of those reaches.

Response: Based on the 1994 Basin Plan, Reach 12 is designated for existing AGR and GWR uses. Reach 13 is designated as intermittent GWR use. The final TMDL will reflect these designated uses.

<u>Margin of Safety</u>

II.S. **LACSD:** The margins of safety have been compounded at every step, including selection of a WQO of 110 mg/L that is not scientifically supported and an instantaneous maximum of 180 mg/L. This compounding of margins of safety is inconsistent with the Porter-Cologne Water Quality Control Act's requirement to reasonably protect beneficial uses.

Carollo Engineers: The use of an additional 10% "safety factor" is not justified based on the fact that conservative modeling assumptions were used, and the critical "low flow" design condition was chosen. Further, any additional "additive" safety factor is not justified unless it can be shown that it is needed based on completing an error propagation analysis on the model.

Carollo Engineers: It is not appropriate to apply an explicit margin of safety to the implicit margin of safety, without some characterization of the model error, and particularly in light of the long-term averaging periods which should be considered for groundwater modeling. As a minimum, a sensitivity analysis should be performed to assess the variation in the calculated TMDL and WLAs due to the observed variation in input data and assumptions. Further, the many conservative assumptions, combined with the statistical approach taken to determine the "critical conditions," already adds significantly to the anticipated level of safety.

Response: As discussed above, the final TMDL no longer uses 110 mg/L as the numeric target. Regarding margin of safety, the Clean Water Act and EPA regulations require that a margin of safety be incorporated. Reasonably conservative assumptions at various stages are designed to address the uncertainty inherent in making best estimates about complex environmental systems when available data are limited. The assumptions made at multiple estimates incorporated into the TMDL do not represent extreme possibilities, but reasonable conservatism, and are not overly conservative. An explicit margin of safety is also appropriate, to compensate for unknown uncertainties such as imperfect knowledge of transport mechanisms and other environmental systems, and 10% is far from an extreme estimate of those uncertainties. Peer review conducted at the behest of the State Board supports the finding that the margin of safety is appropriate given the sources and anticipated magnitudes of uncertainty in the estimates.

Routine and Drought Critical Condition

II.T. **LACSD:** The proposed TMDL selected WLAs for two critical flow scenarios: a critical flow condition that happens to correspond to maximum flow non-storm days; and a drought condition, defined to begin on June 1 of a year in which the previous 12 months' total rainfall is less than 11 inches and end on June 1 of a year when that previous 12 months' total rainfall is greater then 12.2 inches. The National Drought Mitigation Center's definition of drought includes criteria for storage level of reservoirs that can supply water to the receiving area, and defines the drought period to end on June 1 of a year when total rainfall exceeds 11 inches. There is no basis for the TMDL's definition of the end of the drought period.

Carollo Engineers: The conditions specifying when the WLA for drought conditions is effective are not complete, and are problematic for compliance. Neither the discharger nor the RWQCB will know whether the discharger was to have been complying with the more stringent WLA for drought conditions until after the period of compliance has ended. In fact, the WLA should be specified in terms of magnitude, frequency, and duration. The magnitude is chosen with consideration of the duration over which the measurements are made. The allowable frequency is based on the percentage of the time that the underlying water quality criteria can be exceeded without a loss of the designated use for the given duration considered.

Carollo Engineers: It does not seem reasonable to define the beginning of drought-period WLAs as June 1 of any year when the previous twelve months' total rainfall is less than the lower 15% of the historical range as the deep groundwater basins have a substantially longer averaging period. The increased chloride levels in the shallow groundwater basins are not well understood, and there are agricultural management alternatives available, such as the use of increased leaching fraction of irrigation flows.

Response: The WLAs for routine days are computed based on a critical condition that occurs during maximum non-storm discharge (not a condition that happens to corresponds to dry weather, but a condition used in the model to compute the maximum period of impairment at times other than drought periods, and that has been defined statistically in a way that recognizes it may occur at any time of the year, not necessarily during a specified season). The critical conditions for a drought period for the purpose of this TMDL are defined using criteria specific to anticipated environmental factors affecting chloride load in the watershed, and the rationale is described in detail on final TMDL Technical Support Document. The definition is based on a statistical analysis of local rainfall characteristics; text has been added to the final TMDL TSD explaining the rationale for selecting a local as opposed to a statewide definition of drought for the purposes of this TMDL. The basis for selecting 12.2 inches, or the 25th percentile of historical annual rainfall, as the trigger for a non-drought condition is described on in the final TMDL and TSD as well. The TSD has been revised to specify that the total 12-month rainfall is to be measured at the meteorological station at the Camarillo Airport.

II.U. **LACSD:** The TMDL proposes WLAs with lower concentration during drought periods than other periods; it appears to commentor that the goal is a steady state water quality condition. Droughts are natural conditions and fluctuation of water quality is to be expected, in particular in response to droughts, El Nino conditions, and other natural cycles.

Response: The WQO is specified to support reasonable protection of beneficial uses at all times, not during some subset of times. It is necessary for point source allocations to be more stringent during drought because of increases in chloride concentration in discharges from other sources during those conditions. It is worth noting that the assimilative capacity of a waterbody decreases when there is an increase in the anthropogenic source input during the drought condition. Therefore, smaller WLAs are proposed for the drought periods in order to meet the instream WQO.

II.V. **Carollo Engineers:** The evaluation of the critical condition is technically flawed because it is based on the erroneous assumption that flow in the creek(s) is directly related to the recharge of the groundwater basin. This assumption does not consider that the flow of water from the surface streams to the groundwater basin is a function of not only stream flow, but also flow duration, stream chloride concentrations, and the size of the wetted perimeter of the stream cross-section. Therefore, the volume of stream flow to groundwater during periods of high flow stream flows is underestimated, and the resulting stream flow "critical condition" selected is not representative of actual conditions.

Carollo Engineers: Additionally, groundwater quality conditions depend on time scales of years or more, except from very localized conditions. The effect of stream flow chloride on groundwater chloride depends on the average chloride concentration in the stream flow recharge to the groundwater system. In the absence of any other recharge source or other impacts, the long-term groundwater chloride concentration will equal the long-term stream flow-recharge chloride concentration. The long-term recharge chloride concentration depends on the overall stream flow recharge regimen. Stream flow recharge occurs from low, intermediate, and high stream flows. Low stream flows are composed mostly of wastewater discharges, and high stream flows are composed mostly of rainfall-runoff. Low stream flows have higher chloride concentrations, and higher stream flows have much lower chloride concentrations. The resulting steam flow recharge is composed substantially of rainfall runoff, and the stream flow-recharge chloride concentration is substantially less than the wastewater chloride concentrations. In order to appropriately evaluate the recharge impacts of changed wastewater chloride, the overall flow-recharge regimen must be evaluated.

Carollo Engineers: The cumulative frequency plot of the mean daily discharge (mdd) for each of the three creeks should be of the cumulative probability of the flux of stream flows to the groundwater basin , and mass chloride flux into the groundwater basin, and not that of stream flow alone.

Response: The specified critical condition has no relationship to the rate of recharge of groundwater by surface water, or the effect of stream flow chloride on groundwater chloride. The critical conditions for surface water are based on the effects of chloride in groundwater discharge upon surface water chloride, as represented in the mass balance model's assumptions documented in Table A-1 of the Technical Support Document, which are in turn based on documented evidence and best available data about the volume and chloride load of a variety of discharges throughout the watershed including groundwater discharges. We agree that groundwater conditions and the groundwater/surface water interaction are highly complex and affected by a large number of variables which are not fully described in the model. We suggest that many of those interactions are not fully understood, and that the available data are highly inadequate for any valid computation of the interactions that would incorporate those complex mechanisms and environmental variables. Nevertheless, Regional Board staff contends that a statistical model of stream flow alone is sufficient to identify the period of maximum non-storm flow; and that the simplifying assumptions on groundwater conditions and effects on surface water chloride concentration are reasonable assumptions, and lead to a reasonable conclusion that critical conditions occur during maximum non-storm flow. Because many complex interactions and environmental variables are not included in the simplifying assumptions, it is possible that not every instance of maximum non-storm flow may produce the worst-case conditions. However, the available information and documentation leads to a reasonable assumption that when the worst-case conditions do occur, they will occur during maximum non-storm flow. Therefore the WLAs for this TMDL have been designed to address those worst-case conditions that occur during maximum non-storm flow, even though it is not certain that every case of maximum non-storm flow will lead to maximum impairment.

PART 3. DETAILED TECHNICAL COMMENTS

Discrepancies in the Technical Support Document

III.1. **CMWD:** Discrepancies are identified between reported source of data and assumptions and data used in model. In some cases it is unclear how the flow and chloride concentration data presented in Table A-1 were used to generate the data used as inputs to the linkage model for routine critical conditions, presented in Table A-3. (Both tables appear in the Appendix to the Staff Technical Support Document). Commentor tabulates flow and concentration data presented in Tables A-1 and A-3 and indicates that there are discrepancies in a number of locations.

Response: Table A-1 is entitled "Sources of Data for Linkage Analysis and Assumptions Used in Mass Balance Model for Critical Conditions." The title of Table A-1 is perhaps misleading and therefore has been changed in the revised Table A-1, discussed below. It describes sources of data, lists the data used to develop the linkage model for "typical" or "normal" conditions (based on the data sources given), and lists the assumptions used to translate the listed data into critical conditions. The assumptions for translating "typical" into critical conditions are further described in Table A-2.

Table A-1 documents and provides references for the input data and is used to develop the linkage model. The linkage model was developed for "typical low flow" conditions, intended to represent the conditions on normal days in the waterbody not affected by drought or by storm runoff. Table A-1 then lists the data selected by Regional Board staff, using best available information and professional judgement, to represent the flow and chloride concentration under those typical conditions. Those data are duplicated on Table A-3, but not in the column headed "Routine Critical Conditions" (as tabulated by commentor); instead, the data from Table A-1 appear in the column headed "Typical Low-Flow Conditions."

The data for typical low-flow conditions, documented in Table A-1, are adapted to five other conditions (including "Routine Critical Conditions") and presented in Table A-3 along with the data for "Typical Low-Flow Conditions." Table A-2 documents, in words, the rationale used by Regional Board staff to translate the data for "Typical Low-Flow Conditions" into the five flow conditions evaluated in Table A-3.

Table A-1 as presented in the December 21, 2001 Technical Support Document is an outdated version, and does not accurately describe the flow and chloride concentration which were subsequently selected as better representing "typical low flow" conditions. A corrected version of Table A-1 was developed as Regional Board staff understanding evolved and model assumptions were refined and improved. Therefore, extensive revisions have been made to Table A-1. Please see updated Table A-1, entitled "Sources of Data for Linkage Analysis and Assumptions Used in Mass Balance Model for Typical Conditions."

III.2. **CMWD:** Footnote 1 to tabulated discrepancies described in comment II-1: Table A-3 divides Reach 7 into "above USGS gauge" and "below USGS gauge;" Table A-1 introduces another division at Highway 23, which is not included in Table A-3. Table A-1 identifies agricultural extractions and groundwater recharges in Reach 7 that are not included in Table A-3..

CMWD: Footnote 3 to tabulated discrepancies described in comment II-1: names of reaches appear to differ between Tables A-1 and A-3; commentor has assumed that Table A-1 division of data into above and below the USGS gauge is equivalent to Table A-3 division of Reach 9 into Reaches 9A and 9B, differing only in terminology for names of the reaches.

Response: Please see response to previous comment regarding Table A-2. Regarding the other portions of this comment, the commentor's assumptions are incorrect. It was necessary to develop information about the control point (monitoring point), the USGS gauge, for purposes of the model because that is the location for which detailed flow information is available. Table A-1 as presented in the December 21, 2001 Technical Support Document draft does not divide information for Reach 9 into Reaches 9A and 9B. It is an outdated version, developed before Reach 9 was subdivided into Reaches 9A and 9B. Table A-1 has been revised accordingly**.**

However, it is not possible to move the control point (monitoring points) to coincide with the reach division, because the location for which detailed flow data are available does not coincide with the locations chosen for dividing reaches; the latter is based on continuity of hydraulic, water quality, and land use issues, and does not account for the location of the USGS gauge. The USGS gauge is located about 1.5 miles upstream of the US route 101 overpass, as noted in response to comment III.23. The division between Reaches 9A and 9B was located to coincide with the anticipated Camrosa Diversion, which will occur approximately at the US route 101 overpass. That location is selected for the reach division because the flow regime in the waterbody will change dramatically at that location after the diversion is in place, with downstream flow significantly less than flow above the diversion under most conditions.

The errors of the tables are noted and corrected accordingly in the final TSD.

III.3. **CMWD:** Footnote 2 to tabulated discrepancies described in comment II-1: Groundwater discharge and urban non-storm runoff are combined in Table A-1 for Reaches 12 and 13. Table A-1 notes that no data are available to partition the observed instream flow amount of groundwater discharge, urban non-storm runoff, and any other sources. However, Table A-3 does partition the flow into those two categories plus pumped groundwater in Reach 13.

Response: Table A-1 has been revised to reflect data for 0.5 ft^3/sec of pumped groundwater, itemized as “minor sources” in Table 6 in the Technical Support Document. There are no direct data demonstrating how to partition the remaining flow between groundwater and urban non-storm runoff; therefore, the partitioning was based on estimates. The urban non-storm runoff component was estimated to be 2 ft^3/sec for Reach 12 and 3 ft^3/sec for Reach 13, using an analogy with data from Reaches 9B and 11: Boyle Engineering (1987) found urban non-storm runoff to be about 2.7 ft^3/sec for the entire Santa Rosa Valley region. Visual assessment of aerial photos (Calleguas Creek Watershed Management Plan) shows Reach 12 appears to include somewhat less acreage of urban land use than Reaches 9 and 11, so 2 ft^3/sec was selected; Reach 13 appears to include somewhat greater acreage of urban land use, so 3 ft^3/sec was selected. These are the best available estimates for the necessary partition**.**

III.4. **Carollo Engineers:** Please clarify the “specified standard conditions” in the statement, “Regional Board staff made assumptions based on judgments about the most recent data, the most robust data, and the data best represent the specified standard conditions.”... Please specify the “outlier” measurements taken on non-typical days that was excluded.

Response: The specified standard conditions for development of the model are those described in detail in Table A-1, in the Appendix to the Technical Support Document. The table includes a summation of available data used by the Regional Board in its model development, along with a citation of the source of the data. The table also describes, for each assumption, the rationale used by Regional Board staff to make reasonable judgments about the best estimate of typical conditions in cases where available data from separate sources conflict and where available data do not describe the conditions of interest. In some cases the best available estimates were an average of available data computed by Regional Board staff. In a few cases those available data included outlier measurements, such as a data point in the CCCS results which was collected during a rain event, which were clearly not applicable to describing routine, typical conditions in the watershed. Table A-1 includes a description of those averages, including any decisions to exclude outliers and the rationale for those exclusions. An example appears in the response to comment III.18.

<u>Data Age/Quality</u>

III.5. **CWMD:** Flow data used in the linkage model is taken from USGS data reported for the period 1979-83. Staff should have used more recent data for the same gauging stations, collected by Ventura County Flood Control District (VCFCD).

Response: Regional Board Staff elected to rely on USGS data because of the accessibility for downloading and manipulation of those data, as compared to the difficulty in manipulation of the data in files supplied by VCFCD. If the more recent flow data were substantially different from the USGS data for the period 1979-1983, then the more recent data should be used, but Regional Board staff concluded they were not substantially different for the following reasons. Regional Board staff conducted statistical tests using data for the Calleguas Creek gauging station (in Reach 3) collected by

USGS in the period 1996-1998. The statistical analyses showed that flow data for that period had statistics matching those for the period 1979-1983 at the same location, while changes in the flow regime could be clearly seen for the periods 1968-75 and 1976-79 (and were also clearly different for a period of drought in 1969-72). Based on that statistical test, Regional Board staff found that the approximately 1,400 data points in the period 1979-83 were representative of flow characteristics that persisted at least through 1996-98, and therefore were equally descriptive of present flow as the more computationally cumbersome data from Ventura County Flood Control District.

III.6. **CMWD:** Table A-1 describes basis for flow and chloride concentration in Tapo Canyon discharges using a study from Boyle Engineers (1987), and estimates the chloride concentration at 150 mg/L. More recent data are available in the form of four data points (2 wet weather, 2 dry weather) collected under a study by stakeholders funded by a grant under section 205(j) of the Clean Water Act. Those samples' average chloride concentration was about 100mg/L.

Response: We recognize that the data used to characterize Tapo Canyon are not as recent as would be preferred to forecast future conditions. The data from the Boyle study are also limited in that they do not differentiate sources between Reach 8 (Tapo Canyon) and the portion of Reach 7 upstream of the Tapo Canyon confluence. However, estimates based on those data remain among the best available for Reach 8, which is not well studied. Further data from Regional Board monitoring, described in the Technical Support Document, are sufficient to suggest that flow from the canyon does, at least on occasion, contain chloride concentrations of 150 mg/L or greater during periods when non-storm discharges dominate flow in the reach. Data from the 205(j) study are seriously limited by absence of flow information: it cannot be determined whether the data points were collected during storm runoff, during very low flows, or during a period of single improper discharge of non-storm runoff such as lawn watering or equipment wash water. The fact that two of these were collected during wet weather suggests that average concentration measured in these four samples may have been reduced by the presence of precipitation runoff, and may not represent typical low-flow conditions in the reach. The Boyle study provides more complete information, with estimates of low volume and chloride concentration drawn from a period of many years; and the resulting estimate of 150 mg/L is a more conservative assumption.

III.7. **CMWD:** Water quality data on chloride concentration for urban stormwater runoff were taken from the nearby Ballona Creek watershed, as cited on page 36 of the Technical Support Document. Data on stormwater quality are available from VCFCD for the Calleguas Creek watershed, and should have been used instead of data from a nearby watershed. Also, dry weather data from the Ballona Creek watershed are used as the basis for the estimated chloride concentration in urban non-storm runoff from urban land uses in the Calleguas Creek watershed, while dry weather data exists for Calleguas Creek under a study funded by Clean Water Act section 205(j).

Response: Table A-1 in the December 2001 draft document is incorrect in its description of urban non-storm runoff, and has been changed pursuant to this comment. See also response to comment III.1; Table A-1 has been extensively edited. The concentrations used in the model are correctly described in Table A-3, ranging from about 120 to 130 mg/L depending on the data available for dry weather flow in the receiving reach. Data from the study funded by Clean Water Act section 205(j) are from samples of stream flow during dry weather periods, which are not necessarily composed completely of urban non-storm runoff; they may also contain flows such as groundwater discharges, agricultural drainage, and others. Those data are relevant but not definitive in describing urban non-storm runoff. Chloride concentration in urban storm runoff was estimated using data for the Ballona Creek watershed rather than Ventura County because the Ballona Creek data are assumed to better represent urban land uses. The Ballona Creek catchment is more densely developed and has a greater percentage of urban land uses than the Ventura County catchment, which includes a substantial portion of undeveloped and agricultural land. The Ballona Creek data were used to incorporate into the model estimates for chloride loads specifically from urban land uses, and the 20 mg/L number used in the model is more conservative than would be an estimate using data from the Ventura County storm conveyance draining mixed land uses.

III.8. **CMWD:** Information cited in the Technical Support Document about agricultural extractions, groundwater dischargers, and groundwater recharges in Conejo Creek reaches is taken from a 1987 report. More recent information is available from the City of Thousand Oaks, which has conducted a characterization study of the creek system and a review of water rights.

Response: The agricultural withdrawal information in the 1987 report cited was based on data collected in collaboration with the City of Thousand Oaks and was represented as average conditions consistent with a calibrated ground and surface water model. The later information, while more extensive, was considered less useful because 1) it was collected during variable and unspecified surface flow conditions; 2) water quality information was in many cases not associated with information about extraction flow volume; and 3) groundwater withdrawals have been replaced by purchased water and 1987 withdrawals may be more typical of actual agricultural demand if pumped water were of an acceptable quality. Further, a review of the extraction data provided to the Regional Board by Thousand Oaks does not indicate an error in the quantities utilized for the model of a sufficient magnitude to significantly change the results.

III.9. **CMWD:** CCCS data were used by staff as inputs to the model at three locations in the waterbody, but data from sampling stations at other locations in the waterbody were not used. Staff made errors in use of CCCS data (summarized as comments III.15. through III.19.).

Response: Regional Board Staff used best available data to make estimates of flow and chloride concentration from all identified inflows to the waterbody, and for in-stream conditions at a few selected points in the waterbody where both flow and chloride concentration data existed in sufficient data density to support model computations. Because of insufficient flow data about other locations in the waterbody, the model was not capable of predicting flow or chloride concentration at other locations, but instead used results for the key locations to be indicative of water quality at other points. CCCS data were used where applicable to assist in making estimates about inflow and about the selected locations. Other CCCS data that did not assist in characterizing inflows or one of the key locations were not used in the model. In particular, CCCS data in many cases were limited to careful measurements of chloride concentration, and were not accompanied by equally well-defined measurements or estimates of flow at the same location and time. Also, CCCS data were limited to twelve data points; as discussed in response to comments III.27. and III.28. below, that is not considered sufficient density of data to support a validation of the model or statistical relationship between variation in chloride concentration and variation in multiple environmental and anthropogenic factors that affect chloride concentration. See also responses to comments III.15. through III.19.

III.10. **CMWD:** Data from 1999 NPDES reports by POTWs were used in the linkage model to describe current characteristics of POTW discharges. POTWs in the watershed have reported under NPDES for more than 20 years, so more than a single year's data are available. Regional Board staff should have used data for a longer period to capture variations in chloride concentration with varying supply quality, conservation in the service area, use of water softeners, and others.

Carollo Engineers: The current concentrations of chloride reported for the POTW discharges are based on 1999 data and are significantly different than the data from recent years. One year's worth of data is not representative of all conditions. Chloride concentrations in the influent and effluent vary from year.

Response: Data used were for the most recent complete calender year for which data were available at the time of the initial draft TMDL Staff Report and the beginning of the review process by Regional Board, State Board, and USEPA personnel. The most recent information is believed to be the best indicator because several key factors, such as increases in chloride load with expanding use of self-regenerative water softeners in homes, are known to have increased with time, so that averaging data over a longer period would produce a less accurate estimate of anticipated future conditions than use of most recent data. There is no information to suggest that 1999 was an atypical year in terms of drought, water supply sources, or other characteristics.

III.11. **CMWD:** Table A-1 lists discharges from Ventura County WWTP (Moorpark) in Reach 7, upstream of Hitch Road; that is incorrect. Table A-3 correctly lists the same discharge in Reach 6.

Response: Table A-1 has been revised to show discharge from Moorpark POTW to be in Reach 6. See also response to comment III.1.

III.12. **CMWD:** Tables A-1 and A-3 list dewatering wells operated by the city of Simi Valley downstream of Madera Road. Six dewatering wells are operated, and all discharge upstream of the listed location, between Madera Road and First Street.

Response: Tables A-1 and A-3 have been revised to show the pumped groundwater discharges to be upstream of the USGS gauge at Madera Road, and the model has been adjusted accordingly. The model adjustments resulted in some changes to the calculated WLAs and LAs specified in the proposed TMDL, which have been incorporated into the much larger changes that have arisen as a result of the change in the numeric target to meet the current WQO of 150 mg/L rather than the proposed revised WQO of 110 mg/L.

III.13. **CMWD:** Table A-1 lists a control point as describing joint flow from the North and South Forks of Conejo Creek (Reaches 12 and 13), upstream of any influence from Hill Canyon POTW; no such point physically exists because the Hill Canyon POTW discharges into Reach 12 upstream of its confluence with Reach 13.

Response: Such a control point was initially envisioned as describing flow outside the influence of any POTW discharge, but was not ultimately used in the model. Table A-3 is correct in omitting this control point. See also response to comment III.1: Table A-1 has been extensively revised.

III.14. **CMWD:** Table A-3 lists a control point for the model as the USGS gauge for Conejo Creek, and locates that point in Reach 10 upstream of the confluence with Arroyo Santa Rosa. The correct location of that gauge is a highway 101, several miles downstream of the confluence with Arroyo Santa Rosa.

Response: See response to comment III.23.: USGS information describes the location of this gauging station as about 2.5 miles upstream of US route 101. However, Regional Board Staff agrees that the location is actually downstream of the confluence with Arroyo Santa Rosa The model, as described in table A-3, places the control point (at the USGS gauge) as downstream of the Arroyo Sant Rosa confluence and other inflows, withdrawals, and recharges in the Santa Rosa Valley; but upstream of the inflows, discharges, and withdrawals in Reach 9B. That is correct, and the mathematical relationships in the model follow that placement. However, the table incorrectly described the gauge to be placed in Reach 10 rather than the upstream portion of Reach 9B. Table A-3 has been revised to show the correct placement of the gauge.

III.15. **CMWD:** Table A-1 uses data from three stations of the CCCS to compare model results to water quality. Staff made errors in the use of CCCS data in all three cases (summarized in comments III.15. through III.19.).

Response: Table A-1 does not compare model results to water quality data. Rather, it summarizes water quality (and flow) data available to the Regional Board, and describes the rationale and assumptions used by Regional Board staff in selecting best-estimate values for chloride concentration and volume flow, both in the waterbody and in discharges to the waterbody. These data selected by Regional Board staff were used in developing the mass balance model for typical conditions. The errors referenced in the comments have been corrected in the final TSD, as described in detail in responses to comments III.16, III.17, and III.18.

III.16. **CMWD:** Staff error in use of CCCS data: Table A-1 lists data from Station 10 under North Fork Conejo Creek (Reach 12), but Station 10 location was downstream of the confluence of North and South Forks. No CCCS station collected samples from Reach 12.

Response: The Table A-1 listing was intended to show Station 10 data as the best available data for Reach 12, because it includes flow from Reach 12 along with other flows, and because no other data directly address Reach 12. That assumption was in error because Station 10 data are influenced by discharges from the Hill Canyon POTW. There is no actual data for chloride concentration and flow in Reach 12 upstream of the Hill Canyon POTW discharge, so Regional Board staff revised Tables A-1 and A-3 using best professional judgment about characteristics of Reach 12.

III.17. **CMWD:** Staff error in use of CCCS data: Table A-1 uses Station 9 to describe Reach 13, and lists correct chloride concentration average but incorrect flow volume average.

Response: Station 9 data were used in Table A-1 and Table A-3 to describe chloride concentration for Reach 13. Station 9 data were not used to describe flow for reach13, because the CCCS measured or estimated flow at Station 9 on only twelve occasions. The flow listed under Reach 13 in Table A-1, 15 ft^3/sec, is taken from Boyle Engineering (1987); that is the meaning of the notation "As above" in Table A-1. Regional Board Staff recognize that the flow of 15 ft^3/sec describes flow downstream of the confluence with Reach 13, including discharge from the Hill Canyon POTW; that is the meaning of the notation "(part)" in Table A-1, and the reason the best estimate in the right-hand column for flow from Reach 13 is 5 ft^3/sec rather than 15 ft^3/sec. The table is meant to show that the best available flow data for reach 13 is the relevant but not definitive, measurement of 15 ft^3/sec downstream of the confluence of Reach 12. No error was made, but we acknowledge that the table was unclear. Table A-1 has been extensively revised, per response to comment III.1.

III.18. **CMWD:** Staff error in use of CCCS data: Table A-1 uses flow and water quality data from Station 4 to describe conditions in Arroyo Simi at Madera Road, but Station 1 is located at Madera Road.

Response: Table A-1 has been revised to reflect the comment. The table entry of 145 mg/L for chloride concentration at Madera Road has been corrected to 150 mg/L, which is derived from Station 1 data rather than Station 4 data. The average of 12 CCCS measurements at Station 1 is 141.8 mg/L, using data from the July 2000 draft CCCS report, the latest draft that has been supplied to the Regional Boards, submitted by the Participating Agencies on February 11, 2002. Regional Board staff selected

150 mg/L as the best available information by computing an outlier of 50.8 mg/L reported in the April sample. (That sample is shown to have been collected on April 8, 2000, in Appendix A of July 2000 draft CCCS report, but is assumed to be the April 1999 sample cited in comment III.28.). The computed average is 150.1 mg/L, rounded to 150 mg/L. Flow data from the 12 CCCS samples is disregarded, because some flow data occurred during or shortly after rain events, and the average does not represent typical conditions at the Madera Road location.

III.19. **CMWD:** TMDL Staff Report contains errors in Table 5, page 13: CCCS Station 9 is located on the South Fork of Conejo Creek, reach 13; average chloride concentration in samples from Station 10 was 140 mg/L, not 150 mg/L.

Response: Table 5 has been revised to reflect the comment.

III.20. **CMWD:** The model used in the TMDL Staff Report and Technical Support Document assumes no agricultural inputs to the stream system. Recent studies have identified multiple agricultural discharges; those studies include the CCCS; a similar study funded under Clean Water Act section 205(j); and efforts by the City of Thousand Oaks and the Calleguas Municipal Water District.

The Agencies: One reason given by the staff for not considering irrigation returns is that agricultural operators apply the minimum acceptable amount of water... Calleguas Municipal Water District has provided photographs taken by its staff showing substantial runoff from several agricultural operations in the Las Posas Valley.

Response: We agree that surface discharges from agricultural fields exist. The linkage model as applied in the TMDL and Technical Support Document does incorporate inputs from agricultural activities into the stream system, in the form of high chloride concentration in pumped groundwater and spontaneous groundwater discharged at a number of locations. Many discharges from agricultural usage take the form of groundwater seepage rather than direct surface flows. Direct surface water discharges from agricultural land uses are sporadic, dispersed, irregular, highly variable in timing and flow volume, and incompletely quantified, despite the best efforts of recent studies by several stakeholders. In the long run, Regional Board staff expect the volume of these direct discharges to be small in comparison to the volume of other sources, in particular groundwater discharges. The maximum surface runoff to the stream occurs during rain and flood conditions, when the waterbody is not impaired for chloride. Dry weather agricultural runoff has a very high percolation rate, and while exceptions may be identified, was not expected to constitute as large a load to the stream as it is to groundwater. Regional Board Staff elected to attribute all such discharges to groundwater rather than attempt to quantify surface water discharges. Therefore inputs to the model do not identify or quantity surface agricultural drainage in most parts of the watershed. (The only exception is an item in Reach 3, estimating direct return flow from a small number of fields with known tile drain systems.) Discharges subject to the proposed WLAs include not only fields with known tile drains represented by one line in Reach 3 in the model, but all agricultural land uses and any surface water discharge from those locations.

III.21. **CMWD:** Statement on page 27 of the Staff Report for the TMDL is incorrect: "impact of agriculture on shallow, confined aquifers appears to be a more localized problem, and correcting that problem will not solve the watershed wide trend in increasing chloride concentrations in Calleguas Creek."

Carollo Engineers: For the groundwater quality conditions, there appears to be no data and statistical analysis to support the claim that "in many parts of the watershed, the concentration of chloride in the surface water is strongly affected by, if not identical to, the concentration in adjacent or contiguous shallow aquifers.**"**

Response: The specific statement referred to in the comment addresses one particular subset of groundwater resource in the watershed: shallow, confined aquifers. The degree of hydrological connection between shallow and deep aquifers varies widely over the watershed. The shallow, confined aquifers referred to in this statement are contrasted with two other types of aquifer: deep, confined aquifers of large areal extent, where groundwater resources are of great importance to water supply in the watershed; and shallow unconfined aquifers, many of which are in direct communication with surface water and therefore receive chloride from surface water and convey chloride to agricultural users who make use of those aquifers. The statement is meant to convey that the specific problem of shallow unconfined aquifers is not within the scope of this TMDL, is not likely to be solved by improvements of surface water quality, and is not likely to affect surface water quality since these aquifers are not hydraulically connected to the waterbody

III.22. **CMWD:** Commentor applied a model developed by Larry Walker Associates (LWA) for flow and concentration of nutrients in the Calleguas Creek system to predict concentration of chloride. Results for LWA model are tabulated alongside flow and concentration from the RWQCB model presented in the TMDL Staff Report. The model uses flow data from Ventura County Flood Control District and chloride concentrations form the CCCS study.

Response: Tabulated results of the LWA model presented by the commentor differ from results of the RWQCB model presented in the TMDL Staff Report and Technical Support Document. The commentor does not document input data or assumptions used in the model runs, so we cannot determine whether the results presented by commentor differ because of model structure or differing input data. The TMDL Staff Report is based on model results for maximum non-storm flow, concentration derived from multiple references, and input flow volumes and chloride concentrations derived from Regional Board staff's best judgment about how those sources may be expected to change under specified critical conditions. Those assumptions are documented in detail in the Technical Support Document. Absent equivalent documentation, we cannot comment on the validity of the commentor's results compared to the RWQCB model results.

III.23. **CMWD:** The maps used throughout the report do not accurately depict the locations of the USGS gauge Conejo Creek at Highway 101 or the division between Reaches 6 and 7.

Response: The correct location for the upstream end of Reach 6 is described in the Table 1 of the TMDL as Hitch Road, immediately upstream of the Ventura County WWTP at Moorpark. The maps used in the TMDL and Technical Support Document incorrectly show the reach's upstream end about 4 miles too far upstream, upstream of the Route 23 overpass. The Regional Board is in the process of revising the maps for use in the Technical Support Document, but the correction has not yet been made on the maps incorporated in the USEPA document.

The correct location of Conejo Creek USGS gauge, number 11106400, is shown on the USGS web site, URL http://water.usgs.gov/nwis/nwismap/?sit_no=11106400&agency_cd=USGS. The USGS map shows the gauging station about 2.5 miles upstream of the US route 101 overpass at approximately the location shown on the maps in the TMDL and the Technical Support Document. The division between Reaches 9A and 9B is approximately at the US Route 101 overpass.

III.24. **CMWD:** Discussion in Technical Support Document of effects of drought on chloride loads to the watershed (page 3 and elsewhere) is incorrect in suggesting increased volume of imported water is a major factor in adding loads from POTWs**.** The report should instead recognize the major factor is increased chloride concentration in imported water at times of statewide drought, because volume of imported water is high even in non-drought periods.

Response: We recognize the Technical Support Document fails to recognize the magnitude of water importation during non-drought periods. Changes have been made to reflect this emphasis in the final TSD. Reports by agricultural users document an increase in importation during periods of low rainfall in the watershed, and also document a decreased availability of local water supplies. Those reports also document an increase in chloride concentration in imported water during periods of statewide drought, which commonly coincide with periods of low rainfall in the watershed. Both conditions contribute to an increase in the load of chloride in imported water during periods of drought.

III.25. **CMWD:** Technical Support Document on p. 14 states the combined flow from Reaches 12 and13 is approximately equal to that of the larger POTWs in the watershed. Commentor states the flow from these two forks is about 6 to 8 cfs, or about half that of the larger POTWs in the watershed.

Response: The model inputs estimate flow from Reaches 12 and 13 combined to be about 10 ft^3/sec under critical condition (maximum non-storm flow), and about 5 ft^3/sec under typical conditions. Estimated average daily discharge from the two largest POTWs in the watershed is about 15.2 ft^3/sec from Hill Canyon and about 14.1 ft^3/sec from Simi Valley. The word "half" has been added to the statement on p.14. The imprecision in the description on p.14 does not affect calculations or analyses elsewhere in the document.

III.26. **CMWD:** In technical Support Document, equation on p.20 (describing the staff's model for calculating concentration in a reach using data on volume and chloride concentration of inflows and volume of outflows) is presented incorrectly.

Response: Parentheses have been added to the equation on p.20 to accurately reflect the mathematical description of the model's calculation method.

III.27. **CMWD:** Statement in the Technical Support Document, p.40, that the linkage model was not validated is not clear as to whether existing water quality concentrations at the control points were compared to the model results, or if only modeled flows were compared to existing flow information.

Response: Absence of validation is intended to mean that existing water quality concentrations at the control points were not compared to the model results. That validation was not considered viable because data on chloride concentration at the control points are not available in the kind of density that would allow the model results to be compared to chloride concentration under the two critical conditions (maximum non -storm flow and immediate post-drought periods). Flow for those conditions is defined using at least four years of mean daily discharge data, or at least 1,460 data points. Chloride concentration was measured in 12 samples in the CCCS, and at other times under the auspices of various watershed studies and monitoring efforts; but these data points are not sufficiently numerous, and are not sufficiently paired with data on discharge and other environmental conditions, as to allow reliable estimates of concentration during the critical conditions of interest of estimates of how concentration changes with characteristics such as discharge volume, season, depth to water table, antecedent dry period, and other factors that would affect the concentration. The model results were not compared to estimated chloride concentrations at the control points, because chloride concentrations under target conditions could not be reliably estimated.

III.28. **CMWD:** Statement in the technical Support Document, p.42, that the difference in chloride concentrations identified in the CCCS samples is not readily explained, fails to account for rain events known to occur during the April 7, 1999 sample and during or soon after the December 2, 1998 and June 2, 1998 samples.

Response: We acknowledge that Regional Board Staff overlooked the relationship of low-concentration data points CCCS data with the stated rain events. Regional Board staff did not find discussion of those rain events in the CCCS report and did not research precipitation events in assessing the CCCS data. There is little doubt that chloride concentration may be expected to vary with recentness of rainfall in the watershed, as with many other factors. However, there is inadequate data on this factor to justify adjusting the model.

The point of this section in the TMDL was to explain that Regional Board staff made use of the functional model to predict flow rather than using historical data because there was insufficient density of data to develop a historical model relating chloride concentration to variation in a wide range of factors including in-stream flow volume; seasonal fluctuations in factors such as water table depth, evaporation rate, and soil moisture; long-term fluctuations in similar factors caused by drought, annual average temperature, runoff characteristics of the watershed, and other environmental trends; daily and diurnal fluctuations in POTW discharge volume and chloride concentration; and many other factors.

We stand behind the finding that data on chloride concentration and on these many other factors are not sufficiently detailed that we could develop a model predicting response of chloride concentration to these variable. CCCS data consists of twelve data points, one per month for twelve-month period, and do not constitute the density of data that would support a model that could predict chloride density with variation of these factors. We concluded that the mathematically simple, mass-balance, functional model is the greatest predictive detail justified by the current state of data availability.

<u>Linkage Analysis</u>

III.29. **Carollo Engineers**: The linkage analysis is fundamentally flawed because it does not link wastewater discharges to resulting groundwater conditions. In order to establish that linkage, three analyses must be completed. First the average chloride in the stream flow recharge must be determined. The average chloride must be determined not only for existing conditions but also for the implementation of the proposed TMDL. Second, the chloride budget for the groundwater basin must be developed for existing conditions and for the implementation of the proposed TMDL. Third, results of the preceding analyses must be used to determine whether a particular TMDL allocation will produce the desired result. The linkage analysis described in the staff report does (not) complete any of these steps.

Carollo Engineers: The data set used to demonstrate the stream flow quality has to be consistent. Unless factors such as location of the sampling point with respect to the non-point source (such as agricultural drains) is considered in a statistical analysis, the analysis is unreliable, and not representative of actual conditions.

Carollo Engineers: The staff report contains a mathematical description that addresses an element of the overall hydrologic system, but that description is incomplete, and therefore insufficient for decision making.

The Agencies: The discussion of the surface water quality conditions does not include the weather conditions at the time of sampling. Rain and run-off from rainstorms directly affect the data results.

Carollo Engineers: Stream flow impacts on groundwater quality depend not on a "critical" period but the overall stream flow regimen. Correspondingly, the resulting groundwater quality depends not only on low stream flows but also on medium and high stream flows. Ultimately, the stream flow impact on groundwater quality depends on the average chloride concentration within the stream flow recharge to a groundwater basin. With respect to the stream flow recharge, the significance of a particular load to a stream depends on how that load impacts the chloride regimen of the stream flow recharge. Groundwater impacts cannot be assessed by simply tabulating the stream flows, or the chloride loads to a stream.

Carollo Engineers: In the absence of irrigation with groundwater, groundwater discharge from a groundwater basin transports chloride from the groundwater basin, which represents a chloride mass discharge. With the occurrences of irrigation with groundwater, the previous discharge from the groundwater basin is reduced, and the chloride mass discharge from the groundwater basin is reduced. Correspondingly, the groundwater chloride concentrations increase. The reduced chloride outflow impacts the groundwater basin exactly as an increased chloride inflow. Therefore, even though the chloride in pumped groundwater returns to the groundwater system, the consumptive use of the pumped groundwater creates a negative imbalance in the chloride budget. This effect is not considered.

Carollo Engineers: The simplistic method used to calculate urban runoff is not sufficient or consistent with the level of other source estimates. There is no discussion of permeability factors, or the standard runoff coefficients as is common modeling practice for watershed runoff models, such as HSPF.

Response: The linkage analysis and allocation sections of the TMDL have been expanded to more clearly explain the steps in our analysis. The linkage model, like all models, makes simplifying assumptions and represents reality only to a certain degree. The model is sufficiently complete and detailed to project a reasonable approximation of actual chloride sources, transport, in-stream concentrations, and responses to some important variations in conditions. The current best available information about the watershed is limited, as are the current best understandings of exact physical mechanisms of chloride transport, source activities, and responses to complex variations in multiple environmental and anthropogenic conditions. More detailed models could be constructed, but these would require either more detailed assumptions which are not supported by available data, or lengthy and resource-intensive collection of field data. It is not clear that such a more-detailed model would add information necessary to the TMDL decision or remove the uncertainties associated with necessary assumptions. The simplifying assumptions of the model applied in the staff report are reasonable and sufficient to prepare a reasonable estimate of the linkage of sources to in-stream conditions.

III.30. **Carollo Engineers**: There is an internal inconsistency in the linkage model. The Table A-2 states that under routine critical conditions, the concentration of all sources should be assumed identical to standard conditions. Yet, the assumptions for the linkage model consistently assume~~s~~ a different concentration than that outlined in Table A-1A. Flows are different. According to Table A-2, the flows from non-POTW sources are assumed at maximum although the flows are sometimes the same, lower, or higher than the assumed value. The RWQCB made assumptions about flow and chloride loads where adequate data were not available. Again, a more deliberate analysis would allow time for necessary monitoring and modeling to be conducted to gain a better understanding of the chloride flows and loads in the watershed.

Response: The version of Table A-1 included in the December 2001 draft release was incorrect. A substantially revised version of Table A-1 is included in the revised TMDL. The table now is internally consistent with information used to prepare Tables A-3, A-4, and A-5; and Table A-2 accurately describes the logic and assumptions used to extrapolate from conditions presented in the revised Table A-1 to conditions of interest in Tables A-3, A-4, and A-5. Pursuant to the consent decree, this TMDL must be established by March 22, 2002. Future modeling and monitoring may make revision of the TMDL appropriate in the future.

III.31. **Carollo Engineers:** The model was not verified for chloride mass loading, as stated in the report. Therefore, it should be stated that <u>**only flows**</u> were field verified (from a limited data set).

Response: EPA has revised the final TMDL to reflect this comment.

III.32. **Carollo Engineers:** There are significant (conservative) assumptions made in the statistical analysis used to determine the maximum non-storm flow. Yet, in the Technical Support Document page A-3, it is stated that the maximum non-storm flow used for the Conejo Creek location has been adjusted downward from 23 cfs, to 20 cfs. This is an unexplained downward adjustment in stream flow of 15%.

Response: As explained in the TSD, this adjustment both compensates for the slight uncertainty in selecting the point of curvature, and improves the consistency of the flow assumption with other data and assumptions about discharges and withdrawals in that area of the waterbody.

III.33 **Carollo Engineers:** The model assumes immediate and complete mixing of all inputs within each stream reach. What are the lengths of stream reach used for each of these separate discretized sections?

Response: The lengths of the stream reaches are described in Figure 1 and Table 1. The reaches have been defined differently than in the current Basin Plan to better represent uniformity of flow conditions, land uses, pollutant source types, and other characteristics, though that uniformity remains imperfect. Assumed constant chloride concentration within these reaches is another simplifying assumption for the linkage model.

Tile drain source

III.34 **Carollo Engineers:** We disagree with the assumption that the chloride mass loading to groundwater basins due to irrigation practices not be considered as a source. The movement of chloride from agricultural uses into the tile drains (and into the groundwater basins) must be considered a source of chloride, and the water balance must also show a constant withdraw due to evapotransporation.

Response: see response to comment II.E. The movement of chloride from the tile drains is considered as a source of chloride in the TMDL (see Reach 3, downstream of the City of Camarillo). However, other identified direct discharges of agricultural runoff are sporadic, dispersed, and irregular. Since during dry weather agricultural irrigation has a very high percolation rate, direct discharges of irrigation to the surface water is small in volume and contribute much less load than indirect discharges via groundwater. The mass loading to surface water as a result of agricultural irrigation is reflected indirectly in the model, in the form of chloride loads from groundwater discharges, which incorporates loads from all sources to the groundwater. The specific loads to groundwater were not estimated separately for the purpose of the TMDL. Instead, the total load from groundwater discharges was used to estimate the assimilative capacity remaining in surface water for purposes of allocating loads among dischargers in a way that would not exceed the assimilative capacity and cause exceedances of the WQOs.

Fertilizer Impact

III.35. **Carollo Engineers**: Agricultural irrigation adds chloride due to leaching of chlorides from the San Pedro formation, and through applied fertilizers. This source should be considered as a load, in addition to the staff report's characterization of load from agricultural practices as the concentrating effect of agricultural irrigation on the groundwater (and surface waters) due to the loss of dilution water through evapotranspiration.

Carollo Engineers: There are no data that support the assumption that the application of water for irrigation does not add chlorides to the residual water from fertilizer, applied pesticides or topsoils with which the water comes in contact.

Response: Chloride load from fertilizers applied throughout the watershed is found to be very small compared to other sources of chloride, and is therefore neglected in the source analysis and the linkage model. Load from naturally occurring sources is incorporated in the load from groundwater discharges, which is used in calculating the remaining assimilative capacity of the surface water when allocating loads among other discharges.

Data Source

III.36 **The Agencies:** The chloride concentration levels listed in Table 7 s too low. Surface water in the Reach 12 is 200-250 mg/L and the Reach 13 is 165-180 mg/L. The information regarding Hill Canyon POTW is inaccurate. The current discharge quantity is 17.5 cfs. The effluent chloride concentration range between 133-147 mg/L which equals 12,186-13,469 lb/day. The assumed current flow for the Camarillo WWTP is not accurate. Over the past few years, plan flow has averaged 3.6 mgd. Flow diverted for irrigation has averaged 1.3 mgd during the same period. Irrigation is, however, a seasonal use. For several weeks each year the full plan flow is discharged to the creek. The calculation done by the staff should recognize the differing flow regimes during the irrigation and non-irrigation season

The Agencies: For Camrosa WWTP in Reach 3, the report assigned a flow rate of 2.3 cfs (an equivalent of 1.5 mgd, the current capacity of the Camrosa Plant). The chloride concentration assigned is 250 ppm. Camrosa is currently treating 1.35 mgd. A portion of the effluent has been recycled as irrigation water for the past 20 years. Records demonstrate that only about 0.8 cfs or 600 acre-feet per year is percolated in the Camrosa Ponds. Average chloride levels from 1998 to date have been 185 ppm. Because Camrosa recycles effluent for irrigation, its contribution to streamflow groundwater recharge is minimal. As noted above, of the 2.3 cfs cited by the Regional Board, only 0.8 cfs on average is attributed to Camrosa. Treatment by Camrosa of all 0.8 cfs would reduce the total load to the stream by 860lbs.

Response: We stand by our estimate as the best available information. We regard the data used for the one recent period (1999) as a good prediction of future conditions. The use of the 0.8 cfs will be an underestimate because the plant may in the future elect to increase its flow up to its current capacity of 2.3 cfs. It is a common engineering practice to estimate source loadings based on the current information on the plant capacity. The calculated concentration-based WLA presented in the TMDL remains appropriate because that is the concentration predicted to influence groundwater discharges in that reach to attain the concentration that the linkage model predicts will attain the WQO in the receiving water. If the estimate of current conditions is higher than the actual loadings, then the WLA will be more easily attained, since there is actually less chloride to remove than the current estimates.

III.37. **The Agencies:** No source is given for the assertion that there is at least a 2 cfs groundwater discharge in the vicinity of the Camrosa ponds. It would be useful to know the source in evaluating the relative flow contributions of the groundwater, open space discharge, and percolation from the Camrosa ponds. There is a stream that drains the canyon east of the Camrosa ponds that enters the Calleguas Creek in the space between the Camrosa ponds. The "1998 Annual Groundwater Monitoring Report, Final Findings from 2-year baseline Study," found highly mineralized water upgradient from the Camrosa Water District with a flow gradient toward the creek. There is a substantial area of open space east of Calleguas Creek that drains to the Creek.

The Agencies : The characterization of Reach 3 identifies a groundwater beneficial use, but Figure 2 in the TSD shows this as a reach of groundwater discharge to the creek. The rising groundwater contributes to the flow in this reach, thus suggesting that groundwater recharge is not taking place. Rising groundwater is further substantiated in Tables 7 and 8 for the creek system in reaches 3, 9A and 9B in both the "Critical Condition" and in the "Drought Condition" scenarios. Discharges to the creek would not contribute to groundwater recharge in the conditions of rising groundwater.

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Response: Because the Camrosa WWRF effluent is directly discharged to percolation ponds in an area with rising groundwater, it is assumed to rapidly enter stream channel, in the same quantity and with the same chemical characteristics as facility effluent. The Bachman study shows that rising groundwater is directly associated with the surface water discharge in the Calleguas Creek watershed.

<u>**Groundwater Pumping**</u>

III.38. **The Agencies:** Very little groundwater pumping for discharge in Arroyo Conejo occurs in Reach 13. The Agencies suspect inaccuracies exist in the database for groundwater quality and that the data should be verified.

The Agencies: Northrop is not discharging into Reach 13 since it is not able to meet WQOs. It is also unclear from the staff report how the mass load information in the table was derived.

Response: The total volume by the groundwater pumping in Reach 13 is not considered a large volume (427 lb/day annual average) in comparison to other sources. However, data in the current Regional Board database shows the groundwater pumping is an ongoing activity in Reach 13. The Regional Board estimated future discharge volumes based on volumes specified in current NPDES permits, and estimated future loads based on most recent available concentration data for those discharges as measured and reported by the dischargers in accordance with their NPDES permits. If the Northrop discharge is not currently present, then that discharge is in effect complying with the WLA for minor dischargers and not contributing to the chloride load in the waterbody. The mass of chloride load from this source is small compared to other sources, and including it in the mass balance model has a negligible effect on the WLAs assigned to other dischargers.

III.39. **The Agencies:** The staff report makes conclusory statements and does not provide supporting documentation for particular crops grown or their locations.

Response: There is support of the crops grown and their associated locations. The appendices of the Regional Board's proposed revision of reach definitions and the chloride water quality objectives document included surveys of crops grown in the Calleguas Creek submitted by the Calleguas Municipal Water District. The surveys indicated the locations of the crops and types of crops growing in the watershed.

<u>Groundwater Assessment and Natural Sources of Chloride</u>

III.40. **Carollo Engineers :** The TMDL does not attempt to identify the source of increased groundwater chloride. The importance of a particular source can be evaluated only by constructing chloride budgets for the groundwater basins**.**

Response: Control of chloride in groundwater is not the purpose of the TMDL, which is designed to attain WQOs for chloride in surface water. The source of the increased groundwater chloride is not relevant to the analysis for this TMDL. The linkage analysis incorporates load to the surface water from groundwater discharge, and the WLAs are allocated based on the assimilative capacity for chloride in the waterbody, which is in turn affected by the presence of the load from groundwater discharges.

III.41. **Carollo Engineers :** The increased groundwater chloride in deeper aquifers within the Las Posas Basin has been associated with a groundwater-level rise. The chloride increase results from the incorporation into the rising groundwater of irrigation returns within the previously unsaturated zone.

Response: This TMDL is designed to remove the impairment of surface water in the Calleguas Creek system. Analysis of the sources of loads to groundwater, and actions to address impairment of groundwater, are beyond the scope of this TMDL. The load of chloride from groundwater to surface water is incorporated in the form of groundwater discharges to the surface water in various parts of the waterbody.

III.42. **The Agencies**: The text in the Treated Municipal Wastewater section in the TSD is ambiguous as to whether the description of impairment is describing the effects of the Camrosa WRF or the Moorpark facility. Assuming the report is describing the area around the Camrosa water storage ponds, the background shallow chloride concentrations are significantly higher (see Woodward-Clyde Consultants, "Perched Zone Study for a Portion of the Pleasant Valley Groundwater Basin," July 1997, Figure 16). The text also purports that there is heavy use of aquifers, whereas the Woodward-Clyde study cited above shows relatively few wells in the area affected by shallow groundwater. There is extensive use of the deeper confined aquifers that are not influenced by the surface and perched zones. The

Woodward-Clyde study notes that the low aquifer systems are not present east to the Bailey fault in the vicinity of the Camrosa water storage ponds.

Response: The discussion of impairment refers to shallow aquifers in the vicinity of the Moorpark discharge, which have been documented as being used for agricultural irrigation supplies and as being impaired for that use. The effects of discharge from the percolation ponds in the vicinity of the Camrosa plant is to contribute chloride to groundwater in that vicinity, thus contributing to the chloride load in groundwater discharges to the waterbody.

Erosion

III.43. **Carollo Engineers:** The avocado growers have placed lands with a higher risk of erosion into production. It is likely that increasing irrigated crop coverage on the higher erosion risk lands has increased soil erosion. The increasing soil loss, from the sedimentary rock derived soils (approximately 90% of the Calleguas area), is an additional source of chloride contamination to the region. As a general rule, sedimentary rocks contain from 150 to 200 ppm chloride, most of which will go into solution when the soil is eroded. On these upland sites, soil loss of 1 to 2 tons per acre per year is acceptable as "normal" geologic process. The RWQCB analysis does not take this added source into consideration in either the storm runoff or urban runoff contributions.

Response: Presence of chloride at 150 to 200 ppm in rocks and/or soil does not imply the chloride will enter solution at the same concentration. Commonly a large volume of water is required to dissolve chloride and other substances bound with sedimentary rocks, and the concentration of chloride in runoff from those rocks is much lower than the concentration in the rock itself. The load described here is not expected to be large during typical flow conditions, compared to the chloride loads from other identified sources. Sediment load and dissolution of rocks is much lower during non-storm conditions, the critical conditions identified for this TMDL, than during storm conditions, which have been identified as not impaired for chloride in the waterbody.

Drought condition

III.44. **Carollo Engineers:** The total of all of the chloride mass loadings for the drought conditions are greater than the total mass loadings for the critical "typical low-flow" conditions. This is physically impossible, as there are no additional significant sources of chloride loading during a drought, only reductions in flow.

Response: One additional source of chloride load during drought conditions is an increase in chloride concentration, and mass, in domestic water imported by purveyors in the watershed and eventually discharged to the waterbody via the POTWs. Another effect that produces a temporary increase in mass discharged is caused by the mechanisms that describe post-drought conditions (which is the critical condition used to set WLAs for drought periods; the critical period for drought conditions actually occurs in the portion of that period immediately following the drought.) During drought conditions, the shallow and deep aquifers undergo an increase in chloride concentration, caused by reduced recharge of fresh water while concentrating activities such as irrigation continue. Spontaneous discharges of groundwater disappear as the water table falls, and pumped discharges decline or disappear because the water table falls to an elevation where there is no need to pump for de-watering. Then, in the period immediately following the drought, recharge begins and the water table may rise to the point where spontaneous discharges reappear. During at least some days of the post-drought period, it is possible for maximum non-storm flow to occur, when both the pumped and the spontaneous those discharges are at a maximum, equal in volume to the discharges during routine critical conditions. However, the chloride concentration of those discharges is greater than during routine critical conditions, because for some period of time the groundwater remains at an elevated chloride concentration as a result of effects of the drought. For that period of time, the conditions are critical for chloride concentration, and the drought WLAs are designed to attain WQOs during the post-drought critical conditions.

III.45 **The Agencies**: The staff report defines drought critical conditions but does not indicate where rainfall is measured. The staff needs to take into account that much of the much of the water delivered to the urban areas within the Calleguas Creek watershed is imported. Drought conditions in northern California will influence the chloride levels in the water imported into the watershed, even though drought conditions may not exist within the Calleguas Creek watershed.

Response: The TSD describes the definition of drought to include measurement of the rainfall at the Camarillo Airport. The TSD has been revised to include a description of the rationale behind selection of local, rather than statewide, conditions for the definition of drought for the purposes of this TMDL; see response to comment II.T.

POTW Discharge Dilution

III.46. **Carollo Engineers**: POTW dischargers dilute the groundwater. More importantly, contributions from POTWs recharge the basin, allowing accumulating chlorides to be more readily flushed from the basin.

Response: POTWs discharge wastewater which increases the assimilative capacity of the waterbody, allowing them also to discharge some chloride without producing exceedances of the WQO. The surface water of the waterbody does recharge groundwater, and when the assimilative capacity is not exceeded, the recharge reduces concentration of chlorides in the groundwater. However, the load of chloride they are permitted to discharge, as calculated for this TMDL, must be less than the load that would cause an exceedance of that assimilative capacity. WLAs for the POTWs are specified at the maximum allowable concentration and load that will not cause exceedances of the WQO, with a specified margin of safety, considering the total assimilative capacity of the waterbody including the capacity added by the POTW discharges.

III.47. **Carollo Engineers:** The mass balance model estimates in-stream volumes for the low 7Q10 flow conditions assuming "zero discharge of any sources other than POTWs, and therefore zero chloride load other than from POTW discharges." Yet, it is highly likely, and can be shown in the historical record, that agricultural irrigation practices continued during the 7Q10 low flow periods, along with increased chloride loading due to soil leaching of irrigation practices.

Carollo Engineers: There appears to be no data to support the conservative assumption that "periods of zero flow from anthropogenic sources are sufficiently frequent that it is reasonable to assume that a ten-year period would include some seven-day periods where zero flow from anthropogenic sources coincides with of zero flow from natural sources."

Response: Direct discharge of irrigation runoff to the surface water are intermittent, local in effect, and short-lived, in comparison to routine POTW discharges and groundwater discharges. Agricultural irrigation continues during periods of drought, but discharges are not sufficiently large or sustained as to provide routine base flow in the waterbody. Urban non-storm discharges are similarly dispersed and intermittent. The flows for the 7Q10 condition are estimated based on an absence of all anthropogenic discharges, a condition that is reasonable to assume and is used as the definition of lowest flow in the creek. The overly conservative assumptions are used to demonstrate this condition is not a critical condition, so that WLAs need not be calculated for this condition. WLAs calculated for maximum non-storm flow are demonstrated to be adequate to attain WQOs in other conditions by the use of conservative, worst-case assumptions for each of the other conditions; this technique verifies that the worst-case low flow conditions are not as critical as maximum non-storm flow conditions.